2/2 056 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AM0116011

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE 3. CHAPTER I INTRODUCTION 5. II EQUILIBRIUM OF THERMODYNAMIC SYSTEMS WHICH, IN ADDITION TO EXPANSION, PERFORM OTHER TYPES OF WORK 20. III MAGNETICS 47. IV DIELECTRICS 92. V SUPERCONDUCTIVITY 114. VI SURFACE PHENOMENA 138. VII GAS AND LIQUID IN THE GRAVITATIONAL FIELD 163. VIII LIQUID IN A VESSEL IN WEIGHTLESSNESS 183. IX RADIATION 197. X ELASTIC SOLIDS 209. ADDITIONAL LITERATURE 228. THE BOOK DEALS WITH THERMODYNAMICS OF SYSTEMS WHICH, IN ADDITION TO EXPANSION, PERFORM OTHER TYPES OF WORK; DIELECTRICS IN AN ELECTRIC FIELD, MAGNETICS IN A MAGNETIC FIELD, SUPERCONDUCTORS, ELASTIC SYSTEMS, SYSTEMS IN THE GRAVITATIONAL FIELD AND IN WEIGHTLESSNESS. ANALYZED ARE ALSO CERTAIN PROBLEMS OF THERMODYNAMICS OF RADIATION AND SURFACE PHENOMENA. THE BOOK WAS WRITTEN FOR STUDENTS AND POST GRADUATE STUDENTS SPECIALIZING IN THERMOPHYSICS, ELECTROPHYSICS, PHYSICO TECHNICAL AND ENGINEERING PHYSICS FIELDS AS WELL AS SCIENTISTS.

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1/2 030 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--PROSPECTS FOR USING LOW TEMPERATURES IN POWER ENGINEERING -U-

AUTHOR-(03)-SYCHEV, V.V., KIRYENIN, L.A., GERSHENKROY, V.L.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, NO 1, 1970, PP 35-45

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SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), PHYSICS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--CRYOGENIC ELECTRONICS, ELECTRIC POWER TRANSMISSION, SUPERCONDUCTIVITY, TRANSMISSION LINE

CONTROL MARKING--NO RESTRICTIONS

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CIRC ACCESSION NO--AP0123286

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PROBLEMS ASSOCIATED WITH THE ESTABLISHMENT OF SUPERCONDUCTING AND CRYOGENIC ELECTRIC TRANSMISSION LINES ARE DISCUSSED. ADEQUATE ATTENTION IS GIVEN TO TYPE OF CURRENT AND LINE DESIGN (CABLES). SPECIAL ATTENTION IS PAID TO TECHNICO ECONOMIC AND PHYSICO TECHNICAL PROBLEMS WHICH PLAY A DETERMINING ROLE IN THE DESIGN AND PLANNING OF SUPERCONDUCTING AND CRYOGENIC LINES. A DESCRIPTION IS GIVEN OF THE CRYOGENIC CIRCUITS WHICH CAN ENSURE THE PRECOOLING OF CABLES AND MAINTAIN THEIR OPERATING TEMPERATURE DURING OPERATION. AN ANALYSIS IS MADE OF THE PROSPECTIVE DEVELOPMENT OF ELECTRIC MACHINES (MOTORS AND GENERATORS) WITH SUPERCONDUCTING WINDINGS AND OF SUPERCONDUCTING ENERGY STORING DEVICES.

UNCLASSIFIED

SYCHEV, V. V.

Superconducting magnet systems

JPRS 57633
30 Nov 72

SOME PROBLEMS OF BUILDING SUPERCONDUCTING MAGNET SYSTEMS

Moscow, Izvestiya Akademii Nauk SSSR, Energetika i Transport, Russian, No 4, 1972, signed to press 4 January 1972, pp 39-50]

Basic problems facing specialists occupied with the development and operation of large superconducting magnet systems are examined. Problems of ensuring reliability of superconducting magnets are analyzed in detail.

Since the discovery in the early 1950's of class II imperfect superconductors with high critical current densities and strong magnetic fields the technological utilization of superconductivity has been revolutionized. Now superconducting systems are used in experimental physics, power engineering, electrical engineering, radio electronics, space technology, etc. The use of superconducting properties in all these fields ensures higher characteristics compared to ordinary systems, and in many cases is the only possible solution.

Of the various projects now being conducted in the field of superconducting systems the most promising at this time are those aimed at developing superconducting magnet systems (SCMS) for different purposes. Most important among them are efforts to develop large SCMS for large bubble chambers, magnetohydrodynamic generators, large electric motors and power generators. Already several extremely large devices of this type have been developed, such as SCMS for the hydrogen bubble chamber of the Argonne National Laboratory in the U.S. (internal solenoid diameter 478 cm and solenoid height 304 cm, magnetic field induction 1.85 T, stored energy $6 \cdot 10^7$ J) or superconducting scatter winding of the unipolar 2,000 kA

Such a system schematically represents a winding made of superconducting wire that loses electrical resistance when cooled below the critical point of the given superconductor. Windings made of contemporary technical superconductors are cooled, as a rule, to the temperature of liquid helium at atmospheric pressure (4.2 K). By passing through such a winding a strong current it is possible to produce extremely strong magnetic fields. Fields with induction up to 15 T are now being achieved in laboratory devices of this type.

USSR

UDC: [621.318.371:537.312.62]:001.2

SYCHEV, V. V., Moscow

"Some Problems in the Development of Superconducting Magnetic Systems"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 39-49

Abstract: The paper deals with basic problems which now face specialists working in the area of development and operation of large-scale superconducting magnetic systems. Analysis of problems of the reliability of superconducting magnets shows that providing the necessary reliability of windings is one of the most important questions which must be solved in the development of a large-scale superconducting magnetic system. Winding reliability is ensured by using the principal reliability criteria based on known principles of the origin, existence and propagation of the normal zone when designing the winding and selecting the region of working currents.

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USSR UDC: [621.315.55:537.312.62]:001.4

SYCHEV, V. V., ZENKEVICH, V. B., AL'TOV, V. A., KULYSOV, V. A., Moscow

"The Controllable Low-Resistance Shunt Method of Studying the Current--Voltage Curves of Combined Superconductors"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 88-96

Abstract: A method is described for determining the current-voltage characteristics of combined superconductors which can be used to study both short specimens (under isothermal conditions or when there is a temperature gradient lengthwise of the specimen), and specimens in the form of solenoids with open or tight windings. The proposed experimental procedure is simple and convenient, and can be used to study the state of thermal equilibrium of combined superconductors over the entire range of operating temperatures. The method has high sensitivity and gives the current-voltage curves of combined superconductors with negative resistance.

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USSR

UDC: [621.318.371:537.312.62]:001.4

SYCHEV, V. V., ZENKEVICH, V. B., AL'TOV, V. A., KULYSOV, N. A., Moscow

"The 'Double' Solenoid Method for Studying Dynamic Processes in a Superconducting Winding"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 81-87

Abstract: A method is worked out for experimental investigation of processes of propagation of the normal zone in a superconducting winding. The proposed method can be used for precision determination of the principal characteristic currents in combination superconductors used in a winding. The experimental installation described completely eliminates interference from the power supply and control equipment. The procedure is relatively simple and can be recommended as a convenient tool for predicting the behavior of a combined conductor in large superconducting windings.

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USSR

VLADIMIR VASILYEVICH

NEYLAND, V. YA., SYCHEV, V. V.

"Flow Theory in Stationary Cutoff Zones"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of the Central Aerodynamics Institute), 1970, Vol 1, No 1, pp 14-23 (from RZh-Mekhanika, No 11, Nov 70, Abstract No 11B744)

Translation: This article contains a study of the problem of determining the limiting state of a flow in the cutoff zones with a Reynolds number $R \to \infty$. For simplicity, the plane stationary flow of a viscous incompressible liquid along the surface of a body with a notch (recess) is studied. Use of the classical results of Prandtl and Batchelor together with systematic application of the principle of combination of local asymptotic expansions in various regions of the flow permitted construction of the asymptotic picture of the flow field and complete determination of the form of its limiting state. Here, the results of a previous paper by the authors were used (see Izv. AN SSSR. Mekhan. Zhidkosti i Gaza (News of the USSR Academy of Sciences, Fluid and Gas Mechanics), 1966, No 4, pp 43-49, RZh-Mekhanika, 1967, 1B619). The ratio λ of the length of the solid boundary of the cutoff region to the length of the displacement

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USSR

NEYLAND, V. YA., et al., Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of the Central Aerodynamics Institute), 1970, Vol 1, No 1, pp 14-23

layer turns out to be an important parameter of the problem. Depending on the relation between λ and R, various forms of asymptotic flows are possible. An analysis of them is presented, and the methods of their calculation are discussed. A formula is obtained for determining the magnitude of the vorticity ω in the nonviscous part of the region of return currents. A simple approximate method is proposed for the calculations with small ω. The results obtained permit simple generalization to the case of different cutoff flows.

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USSR

UDC 532.526.2:532.526.5

SYCHEV, V. V.

"Laminar Separation"

Moscow, Izvestiya Akademii Nauk, SSSR, Mekhanika Zhidkosti i Gaza, No 3, 1972, pp 47-59

Abstract: In this paper it is shown that when known solutions of the jet theory of an ideal fluid with free flow lines are used for describing an external nonviscous stream in the vicinity of the separation point, it is possible to construct a logical theory of laminar separation in an imcompressible fluid. In such a case, the mechanism of separation of the stream is in many ways similar to the separation of a supersonic stream, and takes place under the action of large local pressure gradients.

An investigation is made of the laminar flow of an incompressible fluid in the vicinity of the separation point on the smooth surface of a solid body. It is shown that at large values of the Reynolds number, separation of the stream takes place under the action of a large local positive pressure gradient, the value of which, during an unlimited increase of the Reynolds

USSR

SYCHEV, V. V., Izvestiya Akademii Nauk, SSSR, Mekhanika Zhidkosti i Gaza, No 3, 1972, pp 47-59

number, tends toward infinity as $R^{1/8}$, while the length of the region of action of this pressure gradient tends toward 0, as $R^{-3/8}$. The limit state of the flow in the vicinity of the separation point when $R \to \infty$ is here described by the known solution of the classical theory of the jet flows of an ideal liquid with free flow lines. 5 figures. 14 references.

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USSR

UDC 533.6.011

MIKHAYLOV, V. V., NEYLAND, V. YA., and SYCHEV, V. V.

"The Propagation of Disturbances in Viscous Hypersonic Streams"

Moscow, Probl. Priklad, Mat. i Mekh. (Problems of Applied Mathematics and Mechanics,), Nauka, 1971, pp 232-243 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2B283, Authors' Abstract)

Translation: The article deals with viscous hypersonic streams of a perfect gas on the basis of the theory of interaction of the boundary layer with an external nonviscous stream. It is shown that if such an interaction is not weak, disturbances caused by any change of the boundary conditions propagate upstream in all cases, all the way to the front edge of the body. From the mathematical point of view this is equivalent to nonuniqueness of expansion of the solution in the vicinity of a sharp front edge, and leads to the problem of finding proper solutions.

In the article an analysis of the solutions is conducted for cases of two-dimensional flow and a three-dimensional field beside a triangular plate with a zero angle of attack. The problem of the origination and development of separation of the boundary layer on a smooth surface is discussed. Eight references

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USSR

SYCHEV, V. V., TERESHCHENKO, S. S., DENISENKO, E. A.

"Resolution of Scanning Cathode Ray Tubes in Input Devices"

Kazan', Vvod i Vyvod Graficheskoy Informatsii v Tsyfrovykh Vychislitel'nykh Mashinakh, Kazan' University, 1972, pp 19-21

Abstract: The paper describes the results of investigation of the feasibility of using scanning readers based on the "Ofort" CRT for processing information from both 35 mm and 70 mm microfilm during computer input. The "Ofort" CRT has the advantages of high speed and resolution of 30-40 lines/mm at 80% modulation in the center of the image for a raster of 70 x 70 mm. The authors studied the possibility of increasing the working field of the raster to 90 x 90 mm with a 25-30 µm scanning spot. The experimental results show that the "Ofort" CRT can be used with a raster field of 90 x 90 mm for a resolution of 30 lines/mm. Thus it should be possible to use this cathode ray tube in processing textual and graphic data stored on microfilm.

USSR

5 Nov 70

The Academy of Sciences USSR, in accordance with Article 23 of the Bylaws, announces the names of candidates to become Full Members (Academicians) and Corresponding Members of the Academy of Sciences USSR, submitted in response to a notice in the newspaper Izvestiya dated 11 and 12 September 1970 by scientific institutions, VUZ, enterprises, social organizations, and scientific workers and groups:

Corresponding Member
Department of Mechanics and Control Processes

SYCHEV, Vladimir Vasil'yevich, Doctor of Physico-Mathematical Sciences, Professor,
TROITSKIY, Vladimir Aleksandrovich, Doctor of Physico-Mathematical Sciences, Professor,
FARMAKOVSKIY, Sergey Fedorovich, Doctor of Technical Sciences, Professor,
KHOLSHCHEVNIKOV, Konstantin Vasil'yevich, Doctor of Technical Sciences, Professor,
TSYPKIN, Yakov Zalmanovich, Doctor of Technical Sciences, Professor,

Izvestiya, 5 Nov 70, pp 3, 4

USSR

UDC: 621.375.421

GLUMOV, B. V., MATUSEVICH, B. S., and SYCHEV, V. A.

"Some Broad-Band Filter Circuits With Linear Phase Characteristics"

Sb. tr. Nauchno-tekhn. konferentsii prof.-prepodavat. sostava Vses. zaochn. elektrotekhn. in-ta svyazi (Transactions of the Scientific-Technical Conference of Professorial-Instructor Staff of the All-Union Correspondence Electrical Engineering Communication Institute--collection of works) No. 5, Moscow, 1970, pp 87-93 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3D30)

Translation: A single-branched piezoelectric filter, a differential-bridge filter, and a filter using piezoceramic resonators and LC elements are examined. A circuit and the characteristics of the filter with seven inductive windings and two transformers are given. V. Ch.

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USSR

UDC: 681.325.65-525

CHAPLYGIN, E. I., TROSHKIN, A. K., SHMELEV, L. F., BORODIN, Yu. F., SYCHEV, Ye. A., GLYZIN, A. N., CHERNYSHEVA, M. A., KASPAROV, G. Ye., Volga Affiliate of the All-Union Scientific Research Institute of Abrasives and Grinding

"An OR-NOR Fluidic Element"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 33, Soviet Patent No 285341, class 42, filed 14 Jul 69, published 29 Oct 70, pp 118-119

Translation: This Author's Certificate introduces an OR-NOR fluidic element which contains supply, control, and output channels; a jet interaction chamber; and also channels which are open to the atmosphere. As a distinguishing feature of the patent, the device is designed for improved stability of the characteristics of the element. The unit contains an added projection on the wall opposite the control channels preceding the corresponding channel which is open to the atmosphere, and also an additional chamber made in this channel which is open to the atmosphere and located immediately behind the projection.

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USSR

UDC 621.771

SEVERDENKO, V. P., Academician, STEPANENKO, A. V., SYCHEV, Ye. G., Belorussian Polytechnical Institute

"Effect of Ultrasound on Plastic Deformation in a Vacuum"

Minsk, Doklady Akademii nauk BSSR, No. 3, Mar 71, pp 217-219

Abstract: Studies showed that the application of ultrasonic oscillations facilitates the process of deformation in a vacuum and makes it possible to avoid adhesion of the metal being treated to the instrument. It is pointed out that high-temperature treatment of refractory metals and alloys is ordinarily accompanied by an intense interaction with gases, thus lowering their plastic properties, making deformation difficult, worsening physicochemical properties and considerably lowering the percent of yield of suitable metal. It is therefore recommended that heating, plastic deformation, and cooling of refractory materials be carried out in a vacuum; however, in such treatment there are practically no oxide films on contact surfaces and this situation leads to an increase in the coefficient of friction, a rise in specific pressures, and adhesion of the deformed metal to the instrument. To carry out hot deformation in a vacuum with

SEVERDENKO, V. P., et al, Doklady Akademii nauk BSSR, No. 3, Mar 71, pp 217-219

the application of ultrasonic oscillations was recommended by Academician Severdenko in 1969 and an installation described here was developed to study the characteristics of this process. It consists of a sealed chamber into which is introduced through opposite windows a resonance waveguide with a hammer fastened at its end and a dye. Ultrasonic oscillations in the waveguide and hammer are excited by a magnetostriction converter. The metal to be deformed is drawn between the hammer and the dye. The wire is pressed to the hammer with a force P acting on the dye. The wire was heated with an electric current. The force of drawing T of the heated wire was measured as a function of the loading force P with and without the application of ultrasonic oscillations in a vacuum and in air. The results showed that under deformation by the ordinary method in a vacuum the drawing force is greater than in air by a factor of 1.7-1.8 and this is attributed to an increase in the forces of contact friction and the appearance of adhesion. Under deformation with the application of ultrasonic oscillations the drawing forces were practically the same in a vacuum and in air but they were considerably less in magnitude than under deformation without ultrasonics. Adhesion of the deformed metal to the instrument was absent in this case.

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USSR

UDC: 621.78:534-8

AYZENTSON, YE. G., VINOGRADOV, V. V., GREVNOV, L. M., and SYCHEV, YE. N., Perm State University

"The Effect of Ultrasound on the High-Temperature Aging of EI69 Grade Steel"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 4, 1973, pp 142-145

Abstract: The authors study the effect of ultrasound on the carbide formation and state of the EI69 grade austenite steel (0.48 percent C, 0.27 percent Si, 0.42 percent Mn, 0.015 percent P, 0.020 percent S, 13.23 percent Cr, 13.30 percent Ni, 0.39 percent Mo, and 2.27 percent W) during its high-temperature aging process. Billets from this grade of steel were held at 1215°C in a salt bath for one hour and cooled in water. Specimens were turned from these billets 10 mm in diameter and 210 mm long. These were subjected to ultrasound with an amplitude within an antinode shift of 15 microns at 700 and 750°C for 15, 30, 60, 90, and 120 minutes with subsequent cooling in water. Control specimens were subjected to the same heat treatment but without ultrasound. Maximal stress cross sections of control and specimens subjected to ultrasound were subjected to x-ray and electron microscope studies. The results show that processing EI69 grade steel with ultrasound during its high-temperature aging leads to the development of a dislocation type structure in the matrix. To this is related the more intense granulation of the

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USSR

AYZENTSON, YE. G. et al., Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 4, 1973, pp 142-145

austenite blocks in the [111] and [200] orientations in the specimens subjected to ultrasound. An increase in the dispersion of the substructure under the effect of ultrasound results in higher steel hardness. It is shown that subjecting steel to ultrasound increases the rate of carbide particle growth and raises the parameter of the crystal lattice of the carbide phase. This could be related to the intensification of the diffusion processes.

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USSR

UDC 541.18.012.4

SYCHEV, YU. N., TSIREL'NIKOV, V. I., Chair of Radiochemistry

"Study of Equilibrium Adsorption of Benzene on Carbon Blacks"

Moscow, Vestnik Moskovskogo Universiteta, Seriya II -- Khimiya, Vol 11, No 5, Sep-Oct 70, pp 542-548

Abstract: The article describes a procedure for studying equilibrium adsorption to a temperature of ~900° C in the 1-760 torr pressure range, based on the use of a Pyrex or quartz membrane manometer. The adsorbate is benzene, the adsorbent graphitized thermal black MT-3100 and channel black. The BET equation is used for an approximate description of the benzene-graphitized thermal black MT-3100 system, i.e. for establishing the relation between P, degree of coverage θ and T° in the 18-270° temperature range. The results indicate that the BET equation satisfactorily describes the temperature dependence of benzene adsorption on the graphitized black at temperatures of 60-270°, but the agreement with experimental data is worse at temperatures of 18-60°. Knowing the constants of the BET equation, it is possible to calculate the adsorption

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SYCHEV, YU. N., et al, Vestnik Moskovskogo Universiteta, Seriya II -- Khimiya, Vol 11, No 5, Sep-Oct 70, pp 542-548

isotherm for any temperature. Adsorption isotherms were calculated for 20, 30, 40, 50, 70, and 100°.

The authors thank V. G. CHUMACHKOVA, N. V. KOVALEVA, R. S. PETROVA, A. A. LOPATKIN and S. N. KRYUKOV for their assistance in the work.

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USSR

UDC 621.396.677.4:621.396.965(088.8)

KHLYUPIN, G. D., SYCHEVA, L. A., MAYOROV, G. I.

"Device for Control of the Beam of a Planar Array"

USSR Author's Certificate No 249061, Filed 24 Oct 67, Published 27 Jan 70 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9B76P)

Translation: The proposed device contains a control unit, a converter and decoders. In order to simplify the device it contains two coordinate multipliers executed from calculating circuits the outputs of which are connected via logical OR circuits to the inputs of the decoders, and the inputs of the multipliers are connected to the outputs of the converter. There are five illustrations.

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Acc. Nr: AP0034109 Abstracting Service: CHEMICAL ABST. 4-70 Ref. Code: UR 0078

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71107n Kinetics of nickel titanate formation. Koshkarev, B. A.; Sychev, V. A. (Ural. Politekh. Inst., Sverdlovsk, USSR). *Zh. Neorg. Khim.* 1970, 15(1), 16–19 (Russ). The reaction of NiO with TiO_2 at 800–1300° give $NiTiO_3$. The kinetics of $NiTiO_3$ formation were studied at different temps. The apparent activation energy of this process is 44 kcal/mole, and at 1000–1100°, $NiTiO_3$ formation rate can be described by the empirical equation: $H' = 18.8/((0.18 + 0.9 \log t)^2$ where t = time.
HMJR

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REEL/FRAME 19210752

1/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--EFFECT OF MAGNESIUM METATITANATE ON THE SINTERING AND SOME PROPERTIES OF CALCIUM ZIRCONATE -U-

AUTHOR-(02)-SYCHEVA, N.A., VOVKOTRUB, E.G.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(3), 585-6

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--CERAMIC TECHNOLOGY, CALCIUM COMPOUND, ZIRCONATE, SINTERING FURNACE, MAGNESIUM COMPOUND, TITANATE, ELECTRIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1512 STEP NO--UR/0363/70/006/003/0585/0586

CIRC ACCESSION NO--AP0120293

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0120293
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SAMPLES TO BE STUDIED WERE PREPD. BY CONVENTIONAL CERAMIC TECHNOLOGY. PHASE COMPN. AND THE MICROSTRUCTURE OF THE SAMPLES WERE DETD. FROM AN EXAMN. OF THE X RAY DIFFRACTION PATTERNS OF CAZRO SUB3 WITH ADDN. OF 10 WT. PERCENT MGTIO SUB3 IT FOLLOWS THAT CAZRO SUB3-CATIO SUB3 SOLID SOLNS. ARE PRESENT IN THE MATERIAL AND MGO IN ZRO SUB2. THE APPEARANCE OF ZRO SUB2 IN CAZRO SUB3 BASED CERAMICS IS NOT DESIRABLE, INASMUCH AS IT LEADS TO A WORSENING OF ELEC.-PHYS. PROPERTIES OF THIS COMPD. MICROSCOPIC INVESTIGATIONS SHOWED THAT ADDNS. OF MGTIO SUB3 ENHANCE NOT ONLY THE SINTERING OF CAZRO SUB3, BUT ALSO THE FORMATION OF A FINE CRYST. STRUCTURE OF THE SAMPLES. THE GRAIN SIZE OF CAZRO SUB3 GRAINS WITH 2 WT. PERCENT ADDN. OF MGTIO SUB3 AMTS. TO 2-5 MU. DATA RELATIVE TO THE CHANGE IN DIELEC. PERMEABILITY AND ITS TEMP. COEFF. ARE PRESENTED. DENSE CAZRO SUB3 SAMPLES WITH SMALL MGTIO SUB3 ADDNS. HAD A HIGH BULK RESISTIVITY AT ROOM TEMP. SAMPLE OF THE COMPN. CAZRO SUB3 PLUS 2 WT. PERCENT MGTIO SUB3 WAS FOUND TO HAVE HIGH INSULATING PROPERTIES, AND THAT AT 400DEGREES ITS RESISTIVITY IS HIGHER THAN 10 PRIME10 OHM-CM. THE RESULTS OBTAINED SHOW THAT MGTIO SUB3 CAN BE USED AS A SINTERING ADDN. TO CAZRO SUB3, WITH THE OPTIMUM AMT. OF THIS ADDN. BEING 2-3 WT. PERCENT. FACILITY: URAL. POLITEKH. INST. IM. KIROVA, SVERDLOVSK, USSR.

UNCLASSIFIED

USSR UDC 512.25/.26+519.3:330.115

EYDEL'NANT, M. I., SYCHEVA, N. I.

"One Generalization of a Numeration Algorithm with Crossing Out"

Nauch. Zap. Tashkent. In-t Nar. Kh-va [Scientific Writings of Tashkent Economics Institute], No 34, 1970, pp 39-50, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V677, unsigned).

Translation: The method of numeration with crossing out is extended to the generalized transport problem.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203220013-6"

USSR

SYCHEVA, S. P., and EIDEL'MAN, Z. M.

"The Effect of Insecticides on Photophosphorylation and the Hill Reaction"

Moscow, Doklady Akademii Nauk SSSR, Vol 191, No 1, 1970, pp 240-243

Abstract: The insecticides used in this study were: lindane (LN), methylmercaptophos (MMP) and methylintrophos (MNP). Chloroplasts, obtained from the young top leaves of a pea plant were incubated in a medium at pH 7.9, to which insecticides were added. Reactions were studied after exposure of mixtures to light. The intensity of phosphorylation was measured by the diminution of phosphorus, and the intensity of the Hill reaction by the regeneration of ferrocyanide, determined spectrophotometrically. Experimental results show that lindane is the most powerful inhibitor of cyclic phosphorylation. In the Hill reaction lindance is powerful in pseudocyclic phosphorylation and less powerful in others. MNP is the most toxic, markedly inhibiting both non-cyclic and pseudocyclic phosphorylation. MNP inhibits photosynthesis, but is weak in cyclic phosphorylation in the Hill reaction MNP is strong in cyclic phosphorylation and weak in others.
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USSR

SYCHEVA, S. P., et al., Moscow, Doklady Akademii Nauk SSSR, Vol 191, No 1, 1970, pp 240-243

In the Hill reaction, MNP is entirely negative in non-cyclic phosphorylation, weak in cyclic phosphorylation and somewhat active in pseudocyclic phosphorylation. Generally the Hill reaction is more sensitive in the presence of phosphate acceptors, which necessitates further study.

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Acc. Nr: AP0044104 Ref. Code: UR 0660

PRIMARY SOURCE: Neyrofiziologiya, 1970, Vol 2, Nr 1, PP 43-51

ROLE OF RETICULAR FORMATION OF THE BRAIN STEM DURING THE PROCESS OF FORMATION OF BACKGROUND ACTIVITY OF CORTEX NEURONS

R. R. Velikaya, T. M. Sycheva

The A. A. Bogomoletz Institute of Physiology, Academy of Sciences, Ukrainian SSR, Kiev

Summary

Background activity of the rabbit visual cortex neurons is inhibited after the section produced of the rostral part of the midbrain reticular formation. Electrolytic lesion of the midbrain reticular formation (nucleus reticularis tegmenti) gives rise to a decrease in frequency and an increase in grouping of spikes of cortical neurons. Substantial changes in impulsation of cortical neurons caused by lesion of specific nuclei of the optic pathway (lateral corpus geniculatum and superior colliculi) were not observed.

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19770575

AP0044104

A comparison of impulse activity parameters of the same cortical neurons recorded before and after functional blocking of the midbrain reticular formation showed an increase in the spike grouping following the reticular formation blockade. It is produced by changes in intervals between impulse groups; the spike frequency within groups is not changed. The data obtained suggest that the midbrain reticular formation might play an important role in the cortical background activity generation as a trigger which determines the appearance of spike groups. The distribution of activity within the groups appears to be connected with cortical mechanism only.

2/2 19770576 DI

1/2 013 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--MODELING OF THE FORMATION PROCESS FOR DIAPIRIC DOMES AND ASTHENOLITHS USING A CENTRIFUGE -U-

AUTHOR--SYCHEVAMIKHAILOVA, A.M.

COUNTRY OF INFO--USSR

SOURCE--GEOTEKTONIKA 1970, (1), 30-40

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--EARTH CRUST, MAGMA, MODEL, CENTRIFUGE, SYNTHETIC RUBBER/(U)SKTV1 SYNETHETIC RUBBER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/0874 STEP NO--UR/9066/70/000/001/0030/0040

CIRC ACCESSION NO--AP0104310

UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104310

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEVELOPMENT OF GEOL. PROCESSES OWING TO MAGMA PRESSURE ON THE EARTH'S CRUST WAS STUDIED BY MEANS OF CENTRIFUGAL DYNAMIC MODELS. THE MODELS CONSISTED OF SUPERIMPOSED LAYERS OF SKTV-1 RUBBER (POLYMER CONTG. ETHYLVINYLSILOXANE AND DIMETHYLSILOXANE UNITS) TINTED RED, D. 0.97, VISCOSITY 10 PRIME5-10 PRIME6 P AND A WHITE PUTTY, D. 2.03, VISCOSITY 10 PRIME6-10 PRIME8 P. THE MODELS WERE SUBJECTED TO THE CENTRIFUGAL GRAVITATIONAL FORCE OF 1000 GRAVITATIONAL UNITS. THE SUBSTANCES DID NOT FLOW NOTICEABLY WITHOUT CENTRIFUGING AND THUS COULD BE DISSECTED IN SEVERAL PLANES AND PHOTOGRAPHED TO PERMIT THE ESTABLISHMENT OF THE TIME SEQUENCES OF EVENTS AND THE RELATIVE FORMATION TIMES OF THE DIAPIRIC DOMES, MAGMATIC ASTHENOLITHS, FOLDS, AND RELATED TECTONIC STRUCTURES.

UNCLASSIFIED

USSR

ZLENKO, A. A., PROKHOROV, A. M., SYCHUGOV, V. A.

"A Thin-Film Laser With Magnitude-Modulated Distributed Feedback"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 18, No 3, 5 Aug 73, pp 156-160

Abstract: A method is proposed for tuning the emission frequency of a thin-film laser with distributed feedback by using spatial modulation of the amount of feedback in the film. The amount of distributive feedback is determined by the amplitude of the periodic variations in the effective index of refraction or amplification factor. If these amplitudes are spatially modulated with period $\Lambda' \gg \Lambda$, then lattices with periods $\Lambda_n = \Lambda(1 \pm n\Lambda/\Lambda')$ will be formed in the film along with the lattice of period Λ, where $n = 1, 2, 3...$ If the wavelength of the emission determined by these lattices falls into the amplification band of the film, then emission should be stimulated on this wavelength with the corresponding pumping. Thus the emission frequency could be tuned by varying the period Λ'. This principle of modulation is experimentally demonstrated by a setup with a rotatable wire grid.

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USSR UDC: None

ZLENKO, A. A., PROKHOROV, A. M., SYCHUGOV, V. A., and SHIPULO, G. P.

"Exciting LaF_3-Nd^{3+} Crystals with Monochromatic Light"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 59, No 9, 1970, pp 785-789

Abstract: The relaxation time of the particles from the 0.53 [illegible]-sorption band of Nd^{3+} ions at the $^4F_{3/2}$ level is determined, and the transverse cross section of the induced radiation in LaF_3-Nd^{3+} crystals is measured in lasers pumped with monochromatic light. The determination of this time is important since it has a definite effect on the operation of the laser. The results of a numerical solution of the problem of exciting laser oscillations in a four-level system with the relaxation time taken into account, pumped by a light pulse lasting 50 ns, are obtained. These results are found from a curve showing the laser radiation as a function of time, through the use of a computer. Formulas are derived to determine the relaxation time from measurements of the time interval between the first two peaks of the laser radiation curve after the pumping pulse. The authors express their gratitude to M. V. Dmi[illegible] to V. V. Osiko for the LaF_3-Nd^{3+} crystals, and to Ye. M. D[illegible] for his comments and discussion.

Acc. Nr: AP0043763 Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 3, pp 817-820

ON THE RELAXATION RATE FROM THE LOWER LASER LEVEL

V. A. Sychugov, G. P. Shipulo

The ion relaxation rate from the lower laser level in four-level systems is investigated. The lower limit of the rate for $LaF_3:Nd^{3+}$ is measured and is found to be $5 \cdot 10^4$ sec^{-1}.

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REEL/FRAME
19770170

4A 21

USSR

UDC: 681.2.087.92-932

VAYKSHIN, L. A., ANTONOV, I. I., SYCHUK, V. M.

"A Pneumoelectric Converter"

USSR Author's Certificate No 253436, filed 22 May 67, published 25 Feb 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 70, Abstract No 11A139 P)

Translation: This Author's Certificate introduces a pneumoelectric converter which contains a device for pneumatic signal input and a piezoelectric element. To improve sensitivity and increase the repetition frequency, the device includes a pneumatic pulse generator (fluid relay). For purposes of inverse conversion, the controlling channel of the generator is connected to an intermediate nozzle-tube element. Supply air is continually fed to the fluid relay. When the signal being monitored arrives at the input as $P_{in}=1$, the air jet in the relay is deflected to channel b, where it acts continuously on the piezoelectric element. In this case there is practically no signal across the output of the piezoelectric element. When the input signal disappears, the jet is deflected to channel c where it enters a pneumatic capacitor. There is an abrupt change in the load on the piezoelectric element, which generates the first electric signal. As soon as the pneumatic capacitor is filled with air to a given pressure, the jet in the relay is

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VAYKSHIN, L. A. et al. USSR Author's Certificate No 253436

deflected once more to channel b, and the piezoelectric element generates a second signal. The capacitor is dumped and the jet is automatically deflected to channel c. In this way, pneumatic and electric pulses are generated at the output. Generation is interrupted when the input signal arrives as $P_{in}=0$. Two illustrations. N. S.

2/2

USSR UDC: 621.382.032.27

SANDULOVA, A. V., GONCHAROV, V. P., SYDIR, B. I., and RYBAK, V. M.

"Ohmic Contacts for GaSb Monocrystals"

Moscow, Pribory i tekhnika eksperimenta, No 4, July-August, 1972, pp 216-218

Abstract: This paper describes a practical method for welding ohmic contacts to n and p type monocrystals of GaSb. The device used in this method is a little stand with a self-contained oven which keeps the flux, under the surface of which the welding is done, molten. To avoid strong local heating, which leads to the formation of acceptor impurities and the consequent reduction in quality of the contact, the crystal is given preliminary heating to 300° C. The contacts used for the p-type crystal were gold wires measuring 30 microns in diameter. A diagram and description of the stand is given together with such details as the method of reducing the contact resistance. A photograph of the contact welds is reproduced, and the volt-ampere characteristic of the ohmic contact, showing its perfect linearity, is plotted. The authors are associated with the Lvov Polytechnical Institute.
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USSR UDC 576.858.4

TAYKOVA, N. V.; SYDORENKO, O. V.; KORNYUSHENKO, N. P.; RUDENKO, A. V.; Kiev State University

"Fractionation of Influenza Virus Type A by Chromatography on DEAE Sephadex A-50"

Kiev, Mikrobiologicheskiy Zhurnal, Vol 33, No 3, May/Jun 71, pp 334-338

Abstract: The effectiveness of the chromatographic method of fractionation of influenza virus type A on DEAE Sephadex A-50 was tested during purification of the following strains of the virus: laboratory type A_{PR-8}, A_2(Singapore)57, A_2(England)57, A_2(Leningrad)67, and A_2(Hong Kong)68. Virus was obtained by infecting 10-day old chick embryos, incubating for 48 hours at 34°C, and then extracting the allantoic fluid. The chromatographic fractionation of virus-containing fluid was carried out on DEAE Sephadex type A-50 in chloride form. The Sephadex was washed on filter paper with 0.5 M hydrochloric acid and water and then

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TAYKOVA, N. V., et al, Mikrobiologicheskiy Zhurnal, Vol 33, No 3, May/Jun 71, pp 334-338

sodium hydroxide with water, suspended in 1/15 phosphate buffer pH 7.4, and poured into a test tube in a quantity necessary for virus purification. The allantoic fluid containing the virus, after centrifugation at 2,500 rpm for a period of 30 min., was added to the adsorbent-containing column; the column contents were then washed with 1/15 M phosphate buffer. Elution of the adsorbed virus was carried out in stages with the use of 0.1-1.0 M solution of sodium chloride in the same buffer. The purity of the virus was determined by content of proteins and nucleic acids in the eluate. On the basis of the obtained data, the method of chromatographic fractionation of viruses on DEAE-Sephadex is recommended for use as one of the methods for purification of influenza virus type A. Under such purification conditions the behavior of each of the strains is specific and may serve as a criterion of the strain characteristics of influenza viruses. Correlation between the chromatographic behavior of influenza viruses, their capacity for adsorption on chick erythrocytes,

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TAYKOVA, N. V., et al, Mikrobiologicheskiy Zhurnal, Vol 33, No 3, May/Jun 71, pp 334-338

and their relation to inhibitors, depending on the structural characteristics of the supercapsid of the viruses, has been established.

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USSR

UDC 615.212.7+612.214.012.1:547.822.3

SOKOLOV, D. B., SYDYKOV, B. T., PRALIYEV, K. D., KURILENKO, V. M. and KHLIYENKO, Zh. N., Institute of Chemical Sciences Kazakh SSR Academy of Sciences, Alma-Ata and Novokyznets Scientific Research Chemical-Pharmaceutical Institute

"The Synthesis of Derivatives of Piperidine and Decahydroquinoline, Their Analgesic and Psychotropic Properties. I. On the Problem of the Relationship Between Structure and Pharmacological Activity of Some Isomeric Decahydroquinoline Derivatives"

Moscow, Khimiko-Farmatsevticheskiy Zhurnal, Vol 7, No 12, Dec 73, pp 7-10

Abstract: In order to study the applicability of the receptor theory, three stereoisomers of decahydroquinoline were synthesized. All were prodionates; one had an axial phenyl group and an axial methyl group at C_2, the second an equatorial phenyl and an axial methyl and the third had both equatorial. The structure of synthetic intermediates were established chemically, spectroscopically and by proton magnetic resonance. Analgesic activity was observed in mice and rats at dosages of 1/5 the LD_{50}, for electrical and mechanical stimuli in two esters and for thermal stimuli in one. The equatorial-

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SOKOLOV, D. B., et al., Khimiko-Farmatsevticheskiy Zhurnal, Vol 7, No 12, Dec 73, pp 7-10

equatorial isomer had no activity. However this compound and the equatorial-axial isomer exhibited antireserpine activity at doses of 1/5 to 1/10 the LD_{50}.

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USSR

UDC: 632.95

SYDYMANOV, B. B.

"Determination of Phosphamide in Corpse Material by the Method of Thin-Layer Chromatography"

V sb. Gigiyena primeneniya, toksikol. pestitsidov i klinika otravl. (Pesticides -- Safety Measures in Using, Toxicology, and the Poison Clinic--collection of works), vyp. 9, Kiev, 1971, pp 187-188 (from RZh-Khimiya, No 7, Apr 72, Abstract No 7N574)

Translation: In order to determine phosphamide (I) and its P=O oxygen analog (II) by thin-layer chromatography in the internal organs of experimented animals in the case of acute poisoning, specimens for analysis were pulverized, saturated with distilled water, and an aqueous extract was prepared after 15 minutes (pH 4-5). This operation was repeated three times, the extracts were treated with $ClCH_2$, the organic layer was dried over Na_2SO_4, concentrated at 50-60°C, and the compounds I and II were determined by thin-layer chromatography on silica gel and potassium sulfate with starch in the C_6H_6-acetone system (3:2), developed by diazotenzenesulfonic acid. The highest concentrations of the chemical were observed in the kidneys, liver and stomach. T. A. Belyayeva.

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USSR UDC 621.378.325

S'YEDIN, V. Ya., KHMELEVTSOV, S. S., Institute of Atmospheric Optics of the Siberian Department of the Academy of Sciences USSR

"Broadening of Focused Light Beams in a Turbulent Atmosphere"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No. 3, 1972, pp 91-96

Abstract: The stochastic parameters of a focused light beam when propagating in a turbulent atmosphere were studied experimentally. It is noted that scattering by heterogeneities of the index of refraction and random refraction of the entire beam as a whole lead to refraction of the beam when especially limited beams of light propagate in a turbulent atmosphere. The average intensity of the beam $\langle J \rangle$ decreases both on the axis of the optical system and in a coordinate system connected with the center of gravity of a beam making random motions in the plane of the receiver. Expansion of light beams is determined by the parameters of the beams themselves and by the magnitude of the structural constant of fluctuations of the index of refraction of air C_n^2. The case in which the distribution of the complex field amplitude at the output pupil of the light source is given by the formula

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S'YEDIN, V. YA., and KHMELEVTSOV, S. S., Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No 3, 1972, pp 91-96

$$U(r)|_{L=0} = U_0 \exp - \left[\frac{\rho^2}{2a_0^2} + i\frac{k\rho^2}{2R}\right]$$

is considered here, where L is the distance along the axis directed along the beam, ρ is the radial coordinate in the plane perpendicular to the direction of propagation, a_0 is the effective width of the beam, and R is the radius of curvature of the wave front at the output pupil. In this experimental study of broadening and random wanderings of focused beams propagating in a turbulent atmosphere, the measurements of statistical characteristics of the broadening and random wanderings were conducted over paths of 1.2, 3.5, and 9.8 km, which were partially over the surface of a river. The average height of the path varied from 10 to 30 m. The following lasers served as radiation sources: LG-36A helium-neon laser operating in an axial vibration mode, the LG-55 single-mode and the GOR-100M pulsed ruby laser operating in a quasisingle mode. The linear dimensions of the beam at the focus are shown as a function of the diameter of the illuminator; the dimensions of the light spot under focusing through a turbulent atmosphere reach a minimum and then are saturated, with an increase in the diameter of the illuminator.

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USSR

UDC 621.371.332.1

S"YEDIN, V.YA., KHMELEVTSOV, S.S., TSVYK, R.SH. [Institute Of Atmospheric Optics, Siberian Branch, AS, USSR]

"Intensity Fluctuations In A Focused Light Beam Passed Through Turbulent Atmosphere"

Izv. VUZ: Radiofizika, Vol XV, No 5, May 72, pp 798-800

Abstract: The paper is concerned with an experimental study of the intensity fluctuations at the focal point of a laser beam, both at the axis of the optical system and in a randomly wandering beam. The applicability is studied of the results of a calculation by K.S. Gochelashvili [Izv.VUZ:Radiofizika, 14, No 4, 592 (1971)] to a description of the fluctuations in a focused beam. The experimentally measured intensity fluctuations are compared with calculated data. 3 fig. 5 ref. Received by editors, 10 May 1971.

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USSR

UDC: 541.183

BYERINH, B. P., PAVLYUCHYENKO, N. M., SYERPINSKIY, V. V., Institute of Physical Chemistry, Moscow, Academy of Sciences USSR

"Temperatures and Entropies of Adsorption in a System of Binary Mixture of Vapors -- Non-Porous Adsorbent"

Minsk, Vestsi Akademii Navuk Belaruskay SSR, No 3, 1970, pp 5-8

Abstract: The authors present theoretical interpretation of the isobaric curves and graphs obtained by other workers experimenting with graphitized lampblack as a polymolecular adsorbent of chloroform and acetone.

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1/2 022 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--NEURONAL ACTIVITY IN THE MEDIAL GENICULATE BODY OF THE CAT DURING MONAURAL AND BINAURAL STIMULATION -U-

AUTHOR-(03)-ALTMAN, J.A., SYKA, J., SHMIGIDINA, G.N.

COUNTRY OF INFO--USSR

SOURCE--EXP BRAIN RES 10(1): 81093. ILLUS. 1970.

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CAT, NEURON, SOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605019/C06 STEP NO--BN/0000/70/010/001/0081/0093

CIRC ACCESSION NO--AP0140573

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0140573

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ACTIVITY OF 93 MEDIAL GENICULATE BODY (MGB) NEURONS WAS EXAMINED IN ANESTHETIZED CATS IN RESPONSE TO MONAURAL AND BINAURAL CLICK STIMULI. THREE TYPES OF REACTION WERE FOUND WITH SINGLE CLICKS: AN INITIAL DISCHARGE (LATENCY: 6-30 MSEC); AN INITIAL AND A LATE DISCHARGE (LATENCY OF LATE DISCHARGE: 0,5 MINUS 4 SEC), AND ONLY A LATE DISCHARGE. UNDER THE CONDITIONS OF LATERIALIZATION (INTERAURAL TIME OR INTENSITY DIFFERENCE OF THE BINAURALLY APPLIED STIMULI) SIGNIFICANT CHANGES AS OF THE INITIAL AS OF THE LATE DISCHARGE WERE FOUND. USING SOULD SIGNALS STIMULATING A MOVING SOUND SOURCE A NUMBER OF NEURONS WERE FOUND TO REACT SPECIFICALLY TO THE DIRECTION OF THIS MOVEMENT. AN ASSUMPTION IS MADE CONCERNING THE ROLE OF THE LATE DISCHARGE FOR THE FIXATION OF INFORMATION ABOUT POSITION OF A SOUND SOURCE IN SPACE. FACILITY: PAVLOV INST. PHYSIOL., ACAD. SCI., LENINGRAD, USSR.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--CHANGES IN A SYSTEM OF ENDOGENOUS GROWTH REGULATORS IN BEAN PLANTS UNDER THE INFLUENCE OF 2,4-D -U-

AUTHOR-(05)-CHIGRIN, V.V., FILINKOLDAKOV, B.V., FADEYEVA, O.I., BORTNIKOVA, T.P., SYKALO, N.I.

COUNTRY OF INFO--USSR

SOURCE--KHIM. SEL. KHOZ. 1970, 8(4), 301-2

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LEGUME CROP, PLANT PHYSIOLOGY, PLANT GROWTH REGULATOR, HERBICIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0021 STEP NO--UR/0394/70/008/004/0301/0302

CIRC ACCESSION NO--AP0137220

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0137220

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWENTY FOUR HR AFTER TREATMENT OF KIDNEY BEAN PLANTS WITH A SOLN. OF THE K SALT OF 2,4-D (2 TIMES 10 PRIME NEGATIVE3 M), THE CONTENT OF INDOLEACETIC ACID (I) IN THE LEAVES WAS UNCHANGED, BUT AFTER 6 DAYS IT WAS DOUBLED. IN THE STEMS OF THE PLANTS THE AMT. OF I DOUBLED, 24 HR AFTER APPLICATION OF THE HERBICIDES. THE ACTIVITY OF I OXIDASE, AND THE CAPACITY OF FIBER HOMOGENATES TO SYNTHESIZE I FROM TRYPTOPHAN, WAS CONSIDERABLY HIGHER FOR PLANTS TREATED WITH 2,4-D. FACILITY: SEVEROKAVKAZ. NAUCH.-ISSLED. INST. FITOPATOL., USSR.

UNCLASSIFIED

USSR

SYKHOVSKAYA, L. I., Institute for Biological Development, Academy of Sciences USSR, Moscow

"An Organ of Taste Is Discovered in the Dolphin"

Moscow, Priroda, No 1, 1972, p 999

Translation: At present most researchers consider that there exists in cetaceans, in particular in the toothed whale, a special organ which detects ambient chemical irritants. However up until now the question of the location of this organ has remained debatable. In 1957 A. V. Yablokov conjectured that the small cavities located on the surface of the root of the tongues of toothed cetaceans were linked with the perception of solutes in water.

In the Institute for Biological Development researchers examined the peculiarities of structure and innervation in the tongue of the common dolphin (D. delphis) and found on the bottom of these tiny pits or cavities several small papillae which were similar in structure and nature to the gustatory pipillae found in other mammals. In the center of each pipilla there is a framework of connective tissue consisting of elastic, collagenous fibers and cellular elements of connective tissue. Typical taste buds are located in the

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1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CHARACTERISTICS OF THE CONTRACTILE CAPACITY OF THE MYOCARDIUM IN PATIENTS WITH SMALL AND LARGE MYOCARDIAL INFARCTION FOCI -U-

AUTHOR--SYNCHUK, A.N.

CCUNTRY OF INFO--USSR

SOURCE--VRACHEBNOYE DELO, 1970, NR 4, PP 64-69

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLCGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CARDIOGRAPHY, MYOCARDIUM, HEMODYNAMICS, CARDIOVASCULAR SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1684 STEP NO--UR/0475/70/004/004/0064/0069

CIRC ACCESSICN NO--AP0129054

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129054

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONTRACTILE CAPACITY OF THE MYOCARDIUM HAS BEEN STUDIED BY MEANS OF POLY AND MECHANOCARDIOGRAPHY IN 103 PATIENTS WITH SMALL AND LARGE MYOCARDIAL INFARCTION FOCI. RESULTS INDICATE THAT STENOCARDIA ATTACKS PRECEDING NECROSIS NEGATIVELY EFFECT THE HEMODYNAMICS AND CLINICAL SYMPTOMS OF DECOMPENSATION WERE PRECEDED BY ALTERATIONS IN THE PHASE CARDIAC ACTIVITY. A COMPLEX OF INDICES WAS DETERMINED CHARACTERIZING COMPENSATION CAPACITIES OF THE CARDIO VASCULAR SYSTEM IN PATIENTS WITH SMALL AND LARGE MYOCARDIAL INFARCTION FOCI.

FACILITY: CHERNOVITSKOGO MEDITSINSKOGO INSTITUTA.

UNCLASSIFIED

USSR

UDC 617.7:611-018]:541.18.047.6-092.9

ZHOKHOV, V. P., SYNGAYEVSKAYA, V. A., IGNAT'YEVA, O. S., and SINENKO, G. F., Doctors, Military Medical Academy imeni S. M. Kirov

"Biochemical Shifts in Eye Tissues Exposed to Laser Radiation"

Odessa, Oftal'mologicheskiy Zhurnal, Vol 26, No 4, 1971, pp 273-277

Abstract: A study was made of biochemical shifts in the tissues of the eye (cornea, anterior chamber, lens, and retina) following irradiation with a pulsed ruby laser. Tests were made on 90 rabbits, while 31 control animals received no radiation. A parallel beam was applied on the cornea with energy of 0.5 joule per square centimeter. With energy densities of 0.6, 0.3, and 0.1 joule per square centimeter on the cornea, an additional optical attachment was placed before the irradiated eye which produced an increased "spot" on the retina (d = 4-5 millimeter). After irradiation, ophthalmoscopy was done on several animals from each series, with the foci measured and fundi photographed. The concentration of sodium and potassium was markedly changed in all eye segments; the level of ascorbic acid shifted markedly in the lens and less so in other segments. Reliable shifts were observed in the SH group content in the lens and retina, and the cholinesterase activity increased

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USSR

ZHOKHOV, V. P., et al., Oftal'mologicheskiy Zhurnal, Vol 26, No 4, 1971, pp 273-277

with energy density of 0.6 moule per square centimeter x 3 on the retina. Test results demonstrated that shifts from the effect of the laser beam may be possible not only in the focus of radiation damage, but in adjacent sectors.

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USSR

UDC 615.849.19.099

SEMENOV, A. I., and SYNGAYEVSKAYA, V. A., Military-Medical Academy imeni S. M. Kirov, Leningrad

"Some General Changes in the Body Caused by Laser Radiation"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 3, 1970, pp 9-12

Abstract: Soon after construction of the first lasers, reports appeared indicating adverse effects on eyes, including blindness. Later animal experiments showed that exposure of eyes to laser radiation also causes many general changes in the body, especially in the cardiovascular system, but also in the central nervous system, endocrine organs, etc. Examination of people working with lasers showed similar trends in human subjects. It was shown experimentally that the adverse effect of laser radiation may be minimized by good hygienic conditions and proper illumination of the work area.

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1/2 028 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--SOME GENERAL CHANGES CAUSED BY THE OPTIC QUANTUM GENERATORS' RADIATION -U-

AUTHOR-(02)-SEMENOV, A.I., SYNGAYEVSKAYA, V.A.

COUNTRY OF INFO--USSR

SOURCE--GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA, 1970, NR 3, PP 9-12

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LASER RADIATION BIOLOGIC EFFECT, EYE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1982/1545 STEP NO--UR/0391/70/000/003/0009/0012

CIRC ACCESSION NO--AP0052749

UNCLASSIFIED

2/2 028 UNCLASSIFIED

CIRC ACCESSION NO--AP0052749 PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REPORTS OF AN ADVERSE EFFECT PRODUCED ON THE ORGAN OF VISION BY OQG (LAZERS) APPEARED ALREADY IN THE FIRST YEARS AFTER THEIR CONSTRUCTION. IRRADIATION OF THE EYES WITH LAZER'S RAYS WAS NOTED APT TO RESULT IN VERY SERIOUS DISTURBANCES OF THE VISUAL FUNCTION, UP TO AND INCLUDING BLINDNESS. THIS IS THE CIRCUMSTANCE THAT HAS BASICALLY PRE DETERMINED THE ORIENTATION OF FURTHER INVESTIGATIONS IN THIS FIELD. LATER ON, HOWEVER, EVIDENCE HAS BEEN GAINED DEMONSTRATING THAT IRRADIATION OF THE EYES IS NOT CONFINED TO OCULAR CHANGES ALONE, BUT CAUSES DIVERSE GENERAL ALTERATIONS IN THE ORGANISM EXPOSED TO IRRADIATION, ESPECIALLY IN ITS CARDIOVASCULAR SYSTEM. EXAMINATIONS OF PERSONS DEALING WITH LAZERS DISCLOSED ANALOGOUS CHANGES TO OCCUR IN THEM TOO. EXPERIMENTAL INVESTIGATIONS ASCERTAINED THAT THE GENERAL ADVERSE EFFECT OF LAZER'S RAYS ON THE ORGANISM CAN BE MATERIALLY REDUCED BY CREATING GOOD GENERAL HYGIENIC CONDITIONS AND, ABOVE ALL, THROUGH PROVIDING PROPER OVER ALL ILLUMINATION OF WORK PLACES AT WHICH LAZERS ARE OPERATED.

UNCLASSIFIED

USSR

UDC: 621.317.3:[621.315.61+621.315.592]

URYVSKIY, Yu. I., SYNOROV, V. F., CHURIKOV, A. A., POPOV, V. A., KONONOV, V. I., LAVRENT'YEV, K. A., MASLENNIKOV, P. N.

"Ellipsometric Method of Checking Dielectric and Semiconductor Films"

Elektron. prom-st'. Nauch.-tekhn. sb. (The Electronics Industry. Scientific and Technical Collection), 1972, No 2, pp 82-83 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12A393 by A. K.)

Translation: The ellipsometric inspection method is distinguished by high information capacity and resolution: It enables simultaneous measurement of the thickness and index of refraction of the film on a substrate during production with accuracy of up to 1 nm and 0.05 respectively. The method is based on determining the change in parameters of polarized light reflected from the surface being studied.

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JPRS 59208

6-73

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XI-15. STUDY OF THE CRYSTALLIZATION CONDITIONS OF ZINC DIPHOSPHIDE

[Article by V. I. Lisoyev, K. B. Aleynikova, V. F. Synorov, Ya. A. Ugay,
Voronezh State University; Novosibirsk, III Simpozium po Protsessam Rosta i
Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 161]

A study was made of the conditions of crystallization of zinc diphosphide
in a broad temperature range (640-1050)°C under the pressure of a volatile com-
ponent-phosphorus — (0.1-45) atmospheres. Under the selected optimal condi-
tions, single crystals of the black version of ZnP_2 to 30 mm in length and
(5-13) mm in diameter were obtained by crystallization from the melts. In the
gas phase, monocrystalline plates of the tetragonal (red) version of α-ZnP_2
more than 100 mm^2 in area and (0.3-2) mm thick and also individual single
crystals of the black version of ZnP_2 were obtained.

X-ray structural and chemical analyses demonstrated that the single crys-
tals of ZnP_2 of the black version obtained by crystallization from a melt (1)
and in the gas phase (2) differ somewhat with respect to composition and
structure. The crystals of the first type belong to the monoclinic syngony
described earlier. The crystals (2) have rhombic symmetry which occurs as a
result of insignificant rearrangement of the monoclinic structure, caused by
variation of the chemical composition.

Synorov, V. F.

USSR

UDC: 621.396.69:621.319.4

ASEYEV, Yu. N., KRYACHKO, V. V., LOBOV, I. Ye., SYNOROV, V. F., KOSOY, A. Ya.

"A Thin-Film Capacitor"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329582, Division G, filed 17 Oct 69, published 9 Feb 72, p 205

Translation: This Author's Certificate introduces a thin-film capacitor in the form of metal plates (e. g. comb plates) applied to a dielectric substrate and covered with a layer of dielectric material. As a distinguishing feature of the patent, the capacitance is increased without increasing the area of the plates by applying a layer of metal to the dielectric.

USSR

UDC: 621.382.002

TOLSTYKH, S. A., SYNOROV, V. F.

"Masking Properties of Silicon Nitride Films"

V sb. Radiofiz. i mikroelektronika (Radio Physics and Microelectronics--collection of works), Voronezh, 1970, pp 86-88 (from RZh-Elektronika i yeye Primeneniye, No 6, Jun 71, Abstract No 6B519)

Translation: Silicon nitride films are produced by rf vacuum vaporization of a silicon electrode onto polished (111) silicon surfaces. A 1,000 Å layer of molybdenum was vacuum deposited by thermal vaporization onto the silicon nitride films as a basis for photolithography. The thickness and index of refraction (2.000-2.105) of the nitride films were checked by an ellipsometric method in monochromatic light with a wavelength of 5461 Å. The electric strength, $(5-9)\cdot10^6$ V/cm, was measured on Al-Si_3N_4-Si structures. The protective properties of the silicon nitride films against diffusion of boron, gallium and phosphorus were studied by determining the depth of the junction beneath the film, and on unprotected segments. Films with a thickness of 300 Å and more give complete protection against boron diffusion when the junction lies 12 μ beneath the surface on unprotected sec-

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TOLSTYKH, S. A., SYNOROV, V. F., Radiofiz. i mikroelektronika, pp 86-88

tions. The source of boron was B_2O_3; diffusion conditions were 1,000°C for 20 minutes; dispersion conditions were 1150°C for 30 hours. A 200 Å film of Si_3N_4 reacts completely with the diffusing agent after 40 minutes of diffusion. Distillation in a molecular oxygen atmosphere should not last too long since silicon dioxide is formed. After 10-12 hours of distillation in a molecular nitrogen atmosphere, a dense B-Si-B film which is insoluble in hydrofluoric acid forms on the surface. Nitride gives complete protection against prolonged diffusion of gallium at 1200°C from a Ga_2O_3 source in a molecular hydrogen atmosphere. Silicon nitride films 1,000-23,000 μ thick protect silicon against phosphorus diffusion from a P_2O_5 source in an argon atmosphere under 1200°C distillation conditions for the time needed to produce a junction at a depth of 7 μ. Films 300-2500 Å thick give no protection against diffusion since they react with phosphorus anhydride to form phosphoric glass. Compaction of films by annealing for 7 hours at 1150°C in a nitrogen atmosphere improves the protective properties. With a film thickness of 1000-2400 Å, a junction at a depth of 11 μ can be obtained on open sections. Bibliography of 5 titles. I. M.

2/2

USSR

UDC 621.52:539.23(088.8)

GOL'DFARB, V. A., GONCHAROV, E. V., and SYNOROV, V. F.

"Method of Vaporization of Materials in a Vacuum"

USSR Author's Certificate No 281997, filed 15 Aug 68, published 7 Dec 70 (from RZh-Elektronika i yeye primeneniye, No 7, July 1971, Abstract No 7A149P)

Translation: A method is proposed which makes it possible to accomplish a process of vaporization from an annular source, which in its turn leads to an increase of the uniformity and purity of the films obtained with its use. During use of the method, the specimen of the substance being sputtered is distributed in the form of disks on a dielectric base coaxial with the inductor, and the frequency of the electromagnetic field is matched in such a way that sputtering can take place only from the lateral face of the specimen. During this a thin layer of the substance on the lateral face melts and is vaporized. The middle part of the specimen is at a lower temperature and does not vaporize. If necessary the dielectric base on which the disks are distributed can be cooled, which completely eliminates the necessity for interaction of the material being vaporized with the material of the dielectric base. A.F.

1/1

USSR

UDC 621.382.3.029.6

PETROV, B. K., KOCHETKOV, A. I., SYNOROV, V. F.

"Calculating the Stationary Temperature Fields in Overlay Superhigh Frequency Transistors"

Moscow, Radiotekhnika i elektronika, Vol 17, No 10, 1972, pp 2176-2181

Abstract: The stationary temperature distribution in the semiconductor crystal of transistors with band emitters was first calculated in the two-dimensional approximation [W. R. Wilcox, IEEE Trans. Electron Devices, ED-10, 5, 308, 1963], and later a simple formula was obtained [V. F. Synorov, et al., Radiotekhnika i elektronika, Vol16, No 6, 1090, 1971] for the thermal resistance of the crystal in superhigh frequency overlay transistors. In the two-dimensional approximation the heat fluxes from the edge emitters in the direction of the Oy axis were neglected, and the emitter bands were considered infinitely long. Now the equation of thermal conductivity has been solved to obtain the stationary temperature distribution R_T and the formula for the thermal resistance of the semiconductor crystal of a superhigh frequency overlay transistor for the more general case of a three-dimensional heat flux. A numerical example of calculating the thermal resistance of a crystal for a standard powerful superhigh frequency silicon transistor is presented to compare the two-dimensional and three-dimensional theories. In real instruments the temperature drop within the emitter area is highly significant (≈50%).

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USSR

UDC: 539.293.621.382.8

SYNOROV, V. F., Prof., Editor

"Fizika poluprovodnikov i mikroelektronika" (Physics of Semiconductors and Miniature Electronics) Voronezh, Izdatel'stvo voronezhskogo universiteta, 1972, 124 pp, p 2

Translation: The papers published here are experimental works on the physics of thin films, miniature electronics, and the results of research in the physics of semiconductor devices.

The collection is designed for scientific personnel, engineers and degree candidates working in the field of semiconductor devices, and for students of advanced courses specializing in these directions.

Bibliography of 86 titles, 47 illustrations, 12 tables.

Printed by decision of the Science Council of the Physics Department, Voronezh State University, 22 January 1969.

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USSR

SYNOROV, V. G., "Fizika poluprovodnikov i mikroelektronika", Izdatel'stvo voronezhskogo universiteta, 1972, 124 pp, p 2

Editorial Department: Prof. V. F. Synorov, Docent A. M. Meleshina, Docent I. D. Zolotarev, Docent N. V. Kotosonov, and Docent F. M. Klement'yev.

Science Editor, V. F. Synorov.

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USSR

SYNOROV, V. F., Prof., Editor

"Fizika poluprovodnikov i mikroelektronika" (Physics of Semiconductors and Miniature Electronics) Voronezh, Izdatel'stvo voronezhskogo universiteta, 1972, 124 pp, pp 123-124

Translation:

TABLE OF CONTENTS

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172 024 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--ENZYMATIC DIAGNOSIS OF ACUTE PANCREATITIS -U-

AUTHOR-(04)-LEVITSKIY, A.P., SYNOVETS, A.S., DEKHTYAR, A.L., TSVIRKUN, F.M.

COUNTRY OF INFO--USSR

SOURCE--KHIRURGIYA, 1970, NR 2, PP 94-98

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PANCREAS, ENZYME ACTIVITY, AMYLASE, BLOOD SERUM, URINE, DIAGNOSTIC METHOD, DIGESTIVE SYSTEM DISEASE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1328 STEP NO--UR/0531/70/000/002/0094/0098

CIRC ACCESSION NO--AP0054212

UNCLASSIFIED

2/2 024 UNCLASSIFIED

CIRC ACCESSION NO--AP0054212 PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS INVESTIGATED THE ACTIVITY OF AMYLASE (SMITH AND ROE MICROMETHOD), PROTEASE UTKINYKH LYNBOVTSEVYKH METHOD IN SHIERGE'S MODIFICATION) AND LIPASE (LEVITSKY'S COLORIMETRIC MICROMETHOD) IN THE BLOOD SERUM OF CATS WITH EXPERIMENTAL ACUTE PANCREATITIS. THERE WERE A SIGNIFICANT RISE OF THE ACTIVITY OF PANCREATIC LIPASE, INESSENTIAL INCREASE OF THE PROTEASE LEVEL, SHORT TERM RISE AND SUBSEQUENT SHARP DECLINE OF THE AMYLASE ACTIVITY. IN THE DETERMINATION OF THE REFERRED TO ENZYMES IN THE BLOOD SERUM AND AMYLASE IN THE URINE OF PATIENTS WITH ACUTE PANCREATITIS THE AUTHORS NOTED A SIGNIFICANT INCREASE IN THE ACTIVITY OF LIPASE AND AMYLASE AND AN INSIGNIFICANT INCREASE OF THE PROTEASE ACTIVITY. A STABLE ACTIVITY RISE WAS OBSERVED IN RESPECT TO LIPASE, THE BLOOD AMYLASE ACTIVITY SEVERAL DAYS AFTER THE ONSET OF THE DISEASE DROPPED ALMOST TO NORMAL VALUES, HOWEVER THE URINARY LEVEL OF AMYLASE WAS STATISTICALLY SIGNIFICANT ABOVE NORMAL LEVELS. THE AUTHORS ALSO DETERMINED THE BLOOD SERUM ACTIVITY OF LIPASE AND AMYLASE, AND URINARY LEVEL OF AMYLASE IN PATIENTS WITH ACUTE CHOLECYSTITIS, APPENDICITIS AND GASTRODUODENAL PEPTIC ULCER. THE NONSPECIFICITY OF THE ACTIVITY OF VLOOD AMYLASE WAS ESTABLISHED. THE INCIDENCE OF RISE OF THE BLOOD SERUM ACTIVITY OF LIPASE IN ACUTE PANCREATITIS AMOUNTED TO 90PERCENT OF CASES, THAT OF URINARY AMYLASE, 70PERCENT. FOR THE DIAGNOSIS OF ACUTE PANCREATITIS THE AUTHORS RECOMMEND THE DETERMINATION OF BLOOD SERUM PANCREATIC LIPASE ALONG WITH THAT OF URINARY AMYLASE.

UNCLASSIFIED

USSR

BISNOVATYY-KOGAN, G. S., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 2, 20 July 1970, pp 64-67

the presence of a magnetic field positrons remain localized, while photons leave an optically thin region, when $r \lesssim 1$. A relativistic plasma of identical particles can exist for extended periods, and energy losses are compensated by radiation, shock waves and varying magnetic fields, as in the radio source regions of pulsars and quasars. Calculations made apply to plasmas having lifetimes longer than the time required for equilibrium to become established.

The authors thank A. Z. Dolginov for stimulating discussions. Orig. art. has 3 refs.

Nuclear Physics

USSR

BISNOVATYY-KOGAN, G. S., [illegible] and SYUNYAYEV, R. A.

"Equilibrium Concentration of Positrons in Optically Thin Relativistic Plasma"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki (Letters to the Journal of Experimental And Theoretical Physics), Vol 12, No 2, 20 July 1970, pp 64-67

Abstract: Physical processes are described for a low-density plasma in which radiation is emitted freely. The positron concentration is determined by the equilibrium processes of pair formation, by collisions of e^- and e^+ with nuclei and each other (without photon emission), and annihilation of electrons and positrons (with photon emission). The principal result is that there is no equilibrium states at temperatures above 20 mev, which is the upper temperature limit of an optically thin relativistic plasma. Relations are given for the second-order annihilation process, the number of annihilations per unit volume per unit time for a Maxwellian distribution of electrons and positrons, and pair formation by charged-particle collisions.

Comparisons are made with processes in astrophysical radio sources in which there are no stationary states, little equilibrium, large temperature variations, and the positron concentration depends on the pumping energy. From energy considerations, pair generation is always much less than synchrotron radiation. In

1/2 022 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--IR ABSORPTION SPECTRA AND SPATIAL STRUCTURE OF STERO ISOMERIC 1,2,5,TRIMETHYL,4,HYDROXY,4,PEPERIDYLCARBINOLS -U-

AUTHOR-(05)-MAMONOV, V.I., DVORYANTSEVA, G.G., SHULAYEV, N.P., SYJYEVA, E.G., UNKOVSKIY, B.V.

COUNTRY OF INFO--USSR

SOURCE--KHIM. GETEROTSIKL. SOEDIN. 1970 (2) 173-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--IR SPECTRUM, MOLECULAR STRUCTURE, HYDROXYL RADICAL, HETEROCYCLIC NITROGEN COMPOUND, HYDROGEN BONDING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1503 STEP NO--UR/0409/70/000/002/0173/0179

CIRC ACCESSION NO--AP0112497

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0112497

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONFIGURATION AND CONFORMATION OF I (R PRIME1 AND R PRIME2 EQUALS H, ME, ET, AND PH) WERE ESTD. ON THE BASIS OF IR SPECTROSCOPIC STUDY OF I INTRAMOL. H BONDS.

USSR

UDC: 8.74

MALYSHEVA, I. I., SYPCHUK, P. P., YURIN, O. N.

"A General Algorithm for Solving the Problem of Laying out Printed Circuit Connections"

Moscow, Kibernetich. sistemy avtomatiz. proyektir.--stornik (Cybernetic Automated Design Systems--collection of works), 1973, pp 74-80 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V596 by O. Belkin)

Translation: In known papers dealing with development of algorithms for laying out printed circuit connections, primary attention is given to overcoming design and technological limitations which differ for each type of board manufacturing technique. Development of a universal method of solving the layout problem which is suitable for any practically realizable technique is possible only on the basis of creating a generalized circuit board model. The paper gives a formalized description of a generalized printed circuit board. A general algorithm for laying out printed circuit connections is proposed. Based on the proposed algorithm, a program was developed for automatic layout of printed circuit connections with regard to hardware limitations. The program is written for the digital computer System 4/50 and contains 15,000 commands.

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USSR UDC: 632.95

SYPIN, G. S., SISTER, Yu. D., KOZLOVA, I. V.

"Polarographic Methods of Analysis of Pesticides"

Probl. analit. khimii [Problems of Analytic Chemistry -- Collection of Works], Vol 2, Moscow, Nauka Press, 1972, pp 145-155 (Translated from Referativnyy Zhurnal Khimiya, No 24(II), 1972, Abstract No 24N574, by T. A. Belyayeva)

Translation: A review of literature data on the use of classical (differential and indirect) polarography, oscillating and alternating current polarography in the analysis of pesticides. The advantages of the use of oscillating polarography over classical polarography for the determination of residues of various pesticides are demonstrated. A summary table is presented on the application of polarography analysis of 70 pesticides. The possibility is demonstrated of using polarographic methods for the study of the mechanism of action and metabolism of pesticides.

1/1

USSR

UDC 539.3.01

TUL'CHIY, V. I., BUDAK, V. D., GRIBICH, N. G., SYPKO, V. P.

"On Determining the Stress Concentration at Danger Points of Plate-Bands With Rounding Off"

V sb. Kratk. tezisy dokl. k Konf. po povrezhdeniyam i ekspluat. nadzhnosti sudovykh konstruktsiy, 1972 (Brief Summaries of Papers at the Conference on Damages and the Operational Reliability of Ship Designs, 1972 -- Collection of Works), Vladivostok, 1972, pp 93-97 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V55)

Translation: Experimental graphs showing the relationship between the stress concentration coefficient and the geometric parameters of the weakening elements are shown for three elongated bands weakened by an opening and various types of punchings. The photoelasticity method was used to conduct the study on the coordinate-synchronous polarimeter KSP-7. The models were made of epoxy resin ED-5 and were subjected to uniaxial uniformly distributed stress. N. T. Glazunova.

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Analysis and Testing

USSR

UDC:669.18:046.546.2

SYPKOVA, YE. A., GINIYATULLIN, I. N., SHADRUNOVA, A. P. and TRAKHTENGERTS, M. L., Magnitogorsk Mining and Metallurgical Institute

"Determination of the Content of Sulfur in Steel by a Thermoelectric Method"

Moscow, Metallurg, No 1, Jan 74, pp 23-25

Abstract: The influence of sulfur on the thermal emf of steel is slight, so that the content of sulfur in a sample of steel cannot be determined by direct measurement of the thermal emf. However, if a strictly measured quantity (1.5%) of aluminum is dissolved in the steel specimen, a portion of the aluminum is bonded with the sulfur, while a portion remains in solid solution. The quantity of aluminum remaining in solid solution is inversely proportional to the quantity of sulfur in the specimen. Aluminum in solid solution has a great influence on the thermal emf, allowing an indirect determination of the content of sulfur in the steel. Laboratory and industrial experiments performed at two metallurgical combines have shown that the method provides good accuracy of sulfur determination (mean square variation from chemical method in sulfur content ranges 0.02-0.12% and 0.12-0.22% is ±0.0025 and ±0.0042% S respectively). The analysis time is not over 1.5-2 minutes.

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USSR

UDC 612.821.6+612.822.3

SYRENSKIY, V. I. and ShChUKINA, N. V., Laboratory of the Physiology of Higher Nervous Activity, Scientific Research Institute of Child and Adolescent Physiology, Academy of Pedagogical Sciences USSR, Leningrad

"Study of Reinforcement Mechanisms by the Method of Correlation EEG Analysis"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti, Vol 23, No 3, May/Jun 73, pp 661-663

Abstract: A group of schoolchildren was tested in a study of bioelectrical brain activity to determine whether the correlation method of EEG analysis is applicable to analysis of reinforcement and non-reinforcement mechanisms. The children were tested while drawing; their own evaluations, positive or negative, served as reinforcement or non-reinforcement. It was found that, in the case of non-reinforcement, there were more qualitative and quantitative changes in relationships between electrical activity in various cortical areas than in the case of reinforcement. The results corresponded to the literature on similar experiments. It was concluded that the correlation method of processing EEG data yields sufficient information to be applicable to such studies.

1/1

USSR UDC 621.791.3.01:669.14.018.44

GRUZDEV, B. L. and KOZLOV, Candidates of Technical Sciences, and VANCHITS, I. S., and SYRESKIN, V. A., Engineers, Ufa Aviation Institute imeni S. Ordzhonikidze

"Technology of Brazing Alloy ZhS6K with Braze VPr 11"

Moscow, Svarochnoye Proizvodstvo, No 2, Feb 74, pp 34-35

Abstract: Since alloy ZhS6K has unsatisfactory weldability, a study was made as to how well it can be brazed in a vacuum using braze alloy VPr 11. The effectiveness of diffusion interaction can be increased by increasing the time of the parts at the brazing temperature. However this brazing method cannot be recommended since undesirable structural transformations can occur in the base metal during an extended time at 1150° C which lowers strength properties. Moreover, long contact of the braze alloy with the alloy causes erosion of the alloy. These problems can be overcome by heat treating the braze joint at 1050° C. Best short-time strength can be achieved by heat treating at 1050° C for extended periods. Tests showed that seam metal strength, after heat treating for 2, 4, and 8 hours, was 30.4, 34.3, and 37.3 kgf/mm^2, respectively, as compared to 27.9 kgf/mm^2 for the non-heat 1/2

USSR

GRUZDEV, B. L., and KOSLOV, et al., Svarochnoye Proizvodstvo, No 2, Feb 74, pp 34-35

treated braze joint. Gap size between the parts being brazed was also critical with the best results achieved for a gap dimension of 0.05-0.06 mm. Four figures, three bibliographic references.

2/2

USSR

TSIBIN, I. P., and SYREYSHCHIKOV, Yu. D., Eastern Institute of Refractories

"Heat-Resistant Lightweight Refractories"

Moscow, Ogneupory, No 7, Jul 70, p 57

Abstract: A method has been developed at the Eastern Institute of Refractories for producing heat-resistant lightweight products half the size of normal bricks of a mass including chamotte, refractory clay, and graphite; the compositions of ordinary charges are presented in a table. The products are pressed at 600 kg/cm^2 and annealed in a medium of technical nitrogen containing up to 2.5% oxygen. The material produced has good heat resistance, since it contains significant quantities of silicon carbide and graphite. It can therefore be used with sharp temperature changes, when the use of ordinary lightweight products is impossible (compensating for the higher cost resulting from the high-temperature nitrogen annealing).

UDC 681.142:669.2

USSR

SALIN, A. A., and SYRGABAYEV, M. R.

"Using Computers to Determine the Optimal Conditions for Electrolysis of Zinc"

Alma-Ata, Vestnik Akademii Nauk Kazakhskoy SSR, No 6, Jun 71, pp 64-68

Abstract: The basic indices characterizing the electrolysis of zinc are the specific consumption of electric power and the power yield of zinc. The zinc power yield is influenced by the following parameters: (a) current density; (b) amount of oxygen; (c) electrolyte temperature; (d) amount of impurities in the electrolyte, including those artificially introduced; (e) duration of zinc accumulation; and (e) rate of circulation of the electrolyte. Considerable attention has been paid to seeking mathematical relationships between the parameters of the electrolysis process and the power yield, but all of the formulas obtained have had no practical application. The authors find a formula based on the concept that the precipitation of hydrogen and, consequently, the zinc power yield are basically associated with dissolving zinc in the electrolyte. Tables are used to show their findings. In addition to the semi-empirical formula for computing the

USSR

SALIN, A. A., and SYRGABAYEV, M. R., Vestnik Akademii Nauk Kazakhskoy SSR, No 6, Jun 71, pp 64-68

power yield of zinc they also find an emprical formula for determining the voltage on the electrolytic zinc bath. They give an example of using computers for computing the optimal electrolysis conditions using these formulas. The article contains 4 tables and 8 bibliographic entries.

2/2

1/2 027 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--DIPOLE MOMENTS OF O, M, AND P CARBAPHOSPHOBORANES B SUB10 H SUB10 PCH -U-

AUTHOR-(04)-ECHEISTOVA, A.I., SYRIKIN, YA.K., ZAKHARKIN, L.I., KYSKIN, V.I.

COUNTRY OF INFO--USSR

SOURCE--ZH. STRUCKT. KHIM. 1970, 11(3), 552

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--DIPOLE MOMENT, DIELECTRIC CONSTANT, BORANE, ORGANIC PHOSPHORUS COMPOUND, ORGANOBORON COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605018/810 STEP NO--UR/0192/70/011/003/0552/0552

CIRC ACCESSION NO--AP0140798

UNCLASSIFIED

2/2 027 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140798

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MOL. REFRACTIVITIES, DIELEC. CONSTS., AND DIPOLE MOMENTS OF THE TITLE COMPDS. WERE DETD. THE DIPOLE MOMENTS OF THESE COMPDS. WERE COMPARED WITH THOSE OF THE CORRESPONDING ISOMERS OF B SUB10 H SUB10 C SUB2 H SUB2. FACILITY: INST. ELEMENTOORG. SOEDIN, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.382.3

SYRKIN, L. N., FEOKTISTOVA, N. N.

"Effect of Localized Pressure on the Characteristics of Fiele-Effect Transistors"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 5, No 5, May 1971, pp 880-883

Abstract: A study was made of the effect of localized pressure on the volt-ampere characteristics of PT2 germanium field transistors with a p-n junction and an n-type diffusion channel. An experiment is described in which the pressure was applied by means of a corundum needle directly to the open surface of the channel perpendicular to the junction plane. The variation of the discharge current with constant voltage on the gate is determined in the first approximation by the piezoresistive effect in the semiconductor forming the channel, and with a constant gate current, the increase in the effective thickness of the channel as a result of varying the concentration of the minority carriers at the boundary of the p-n junction under the effect of mechanical stress. The measurements demonstrated that the second effect plays

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USSR

SYRKIN, L. N., et al., Fizika i Tekhnika Poluprovodnikov, Vol 5, No 5, May 1971, pp 880-883

the predominate role. The sensitivity of the investigated transistors to pressure in a variable signal is somewhat lower than for ordinary junction transistors. It is 0.01-0.3 microamps/dyne.

2/2

1/2 032 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--PIEZORESISTANCE AFFECT IN SBSI -U-

AUTHOR-(03)-ZAVYALOVA, A.M., ZAKS, P.L., SYRKIN, L.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(5), 1580-2

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MECH., IND., CIVIL AND MARINE ENGR, PHYSICS

TOPIC TAGS--ANTIMONY, IODIDE, SINGLE CRYSTAL, SULFUR COMPOUND, PHASE TRANSITION, HYOROSTATIC PRESSURE, HIGH PRESSURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0962 STEP NO--UR/0181/70/012/005/1580/1582

CIRC ACCESSION NO--AP0133048

UNCLASSIFIED

2/2 032 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0133048

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF HYDROSTATIC PRESSURE (1-1000 ATM) WAS INVESTIGATED OF DARK COND. OF SBSI CLOSE TO THE POINT OF THE PHASE TRANSITION ON POLYCRYST. SPECIMENS AS WELL AS ON SINGLE CRYSTALS. FROM RESULTS OF THE MEASUREMENTS OF THE PRESSURE DEPENDENCE OF SP. RESISTANCE, THE COEFF. OF PIEZORESISTANCE AT HYDROSTATIC PRESSURE WAS CALCD., WHICH IS A COMBINATION OF LONGITUDINAL AND TRANSVERSE COEFFS. IN THE REGION OF THE PHASE TRANSITION, A SHARP MAX. WAS OBSD. IN THE DEPENDENCE OF THIS COEFF. ON TEMP. WITH INCREASED PRESSURE, THE MAX. IS SHIFTED TOWARDS LOWER TEMPS. AND ITS MAGNITUDE DECREASES MONOTONICALLY, BUT STILL REAMINS LARGE EVEN AT TEMPS. FAR FROM THE PHASE TRANSITON. PRESSURE DERIVS. OF THE ENERGY OF THE ACTIVATION AND THE WIDTH OF THE FORBIDDEN BAND HAVE MAX. AT THE PHASE TRANSITION WHICH WITH INCREASED PRESSURE ARE SHIFTED TOWARD LOWER TEMPS.

UNCLASSIFIED

USSR UDC 632.43-233.13

MOZOKHIN, N. G., NORMUKHAMEDOV, B. F., SYRKIN, P. E., Candidate of Technical Sciences. Gor'kiy Motor Vehicle Plant. Zavolzhskiy Motor Vehicle Plant.

"An Investigation of the Lubrication Conditions in the Crankshaft Bearings of the GAZ-53 Engine"

Moscow, Avtomobil'naya Promyshlennost', No 10, September 1971, pp 4-7

Abstract: The operation of GAZ-53 engines shows that the longevity of crankshafts necks and of their bearings is determined by the value the wear of the necks and bottom liners of the crankshaft bearings, the wear intensity of which is on the average 2 - 3 times greater than the wear intensity of the connecting rods and liners. In order to determine the reasons for this, measurements were made of the thickness of the lubricating layer in the crankshaft bearings and the connecting-rod bearing (and of the temperature field of the crankshaft bearings, not treated in this article). The thickness of the lubricating layer was determined by measuring it by means of a capacitance method, first developed in the USSR. The principle of measurement is described. It is shown that the thickness of the lubrication layer h in the connecting-rod bearings of the GAZ-53 engine is entirely sufficient

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MOZOKHIN, N. G., et al, Avtomobil'naya Promyshlennost', No 10, September 1971, pp 4-7

to provide liquid friction under all conditions of engine operation. The investigations showed that the thickness of h in the crankshaft bearings has the greatest values in the zones situated on the crankshaft necks opposed to the counterweights. On the countrary sides, the values of h_{min} are sufficient at all conditions of engine operation. When the engine is idling, the values h_{min} in the regions of the lower and upper bearing liners are practically identical. With a load upon the engine, the loads upon the bottom liners increase considerably; here h_{min} decreases, and increases in the region in the upper bearing liners. Consequently, the longevity of the upper liners is considerably greater than that of the lower liners. The increased longevity of the connecting-rod necks and liners of the GAZ-53 engine is five times greater than that of the GAZ-51 engine, due mainly to the provision of sufficient values of h_{min} in the connecting-rod bearings at all conditions of engine operation; this, in turn, is caused by selection of the optimal design parameters of the associated parts. 5 figures. 5 tables. 6 references.

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POGODIN-ALEKSEYEV, G. I., GAVRILOV, V. M., KHRAMOV, S. P., KHAVROSHKIN, O. B., SYRKIN, V. G., and UEL'SKIY, A. A.

"Method of Producing Dispersed Materials"

USSR Authors' Certificate No 301379, Cl. C 23c 11/02, B 22 f 1/00, filed 7 Apr 66, published 2 Jun 71 (from RZh-Metallurgiya, No 1, Jan 72, Abstract No 1C263P)

Translation of Abstract: A method is suggested for producing dispersed materials by the application of refractory metal compounds to powders through thermal decomposition of vapor of the metal-containing component, with the powder with enhanced mechanical properties, delivery of a layer of powder of the refractory compound is alternated with vapor of the metal-containing component in amounts sufficient to grow a layer of metal, with the metallic component that forms during thermal decomposition undergoing treatment by ultrasonic vibrations through a gaseous medium.

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1/2 036 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--PREPARATION OF TUNGSTEN COATINGS BY A CARBONYL METHOD -U-

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SPECIALLY CONSTRUCTED APP. IS DESCRIBED IN DETAIL FOR OBTAINING W COATINGS ON BASES OF VARIOUS FORMS BY THE PROCESS OF THERMAL DISSOCN. OF W(CO) SUB6. INCREASING THE TEMP. OF THE SUBSTRATE 400-700DEGREES INCREASED THE SPEED OF COATING FORMATION, WHILE HIGHER TEMPS. CAUSED A DECREASE. THE CARBONYL DECOMPN. METHOD RESULTED IN COATINGS WITH MICROHARDNESSES OF 400-1800 KG-MM PRIME2, CORRESPONDING TO A C CONTENT OF 0.02-1.00 WT. PERCENT. AR AS THE CARRIER GAS WAS PREFERABLE TO HE OR H.

UNCLASSIFIED

USSR

SYRKIN, V. G., Candidate of Technical Sciences

"New Metal Films and Coatings"

Novyye Metallicheskiye Plenki i Pokrytiya [English version above], Znaniye Press, Moscow, 1972, 32 pp.

Translation: Chemical methods for the production of metal films and coatings, particularly methods of vapor-phase deposition of volatile metal compounds, have been little covered to date by the authors of studies dedicated to modern methods of metalization of various materials. This is explained by the fact that the development of such modern branches of science and technology as electronics, missile and space technology, machine building and nuclear power engineering have been the primary occupations of physics and related sciences. We are therefore not surprised by the development of such methods of surface metallization as, for example, thermomechanical sputtering of molten metal and its subsequent condensation as a coating on the surface of a substrate. The methods of cathode sputtering of metals and vacuum evaporation, which have already become classical, have been widely popularized (particularly in the past decade). These two methods have been successfully used in the manufacture of thin ferromagnetic films used in computers as memory elements.

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Syrkin, V. G., Novyye Metallicheskiye Plenki i Pokrytiya, Znaniya Press, Moscow, 1972, 32 pp.

However, these and the many other methods of metallization of surfaces which might be called physical do not exhaust the range of processes provided by modern science and technology. Furthermore, in spite of the worthy and significant successes of physical methods, in many cases it is expedient to select different methods of metallization, particularly chemical methods.

Among the many chemical methods of production of metal films and coatings, the vapor phase method of thermal decomposition of volatile metal compounds, allowing metal layers to be produced at temperatures far below the melting points of the corresponding metals and alloys, has attracted interest recently. We can say without exaggeration that thermal dissociation methods have great potential capabilities. Significant progress has been achieved in this direction in recent years, primarily due to the use of metal halides and carbonyls, as well as certain organometallic compounds.

Since we cannot study in detail the entire range of volatile metal compounds of all types, we will consciously limit ourselves in this brochure to the description of methods of thermal decomposition of metal carbonyls and certain halide derivatives. Considering the great significance of preliminary preparation of product surfaces (substrates), we will also turn particular attention to proper selection of the method of surface cleaning.

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Syrkin, V. G., Novyye Metallicheskiye Plenki i Pokrytiya, Znaniya Press, Moscow, 1972, 32 pp.

The low temperatures of the process, the availability of the initial substances used, the simplicity, speed and cheapness of the equipment, the ease of metallization of internal surfaces and products of complex shapes, the possibility of automation of the process and, finally, the high quality of the metal coatings and films produced -- all of this indicates that the vapor-phase method of chemical metallization is one of the most promising methods available.

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